Claims

1. A trench-type storage device comprising:
a substrate;
at least one trench in said substrate;
conductive carbon nanotubes lining said trench; and
a trench conductor filling said trench.

2. The storage device in claim 1, further comprising a trench dielectric between said carbon nanotubes and sidewalls of said trench.

3. The storage device in claim 1, characterized in that the conductive carbon nanotubes form an open cylinder structure lining said trench.

4. The storage device in claim 1, characterized in that the trench conductor comprises at least one of polysilicon, a metal, and an alloy thereof.

5. The storage device in claim 1, characterized in that the conductive carbon nanotubes and a separate trench conductor material are disposed in the trench, and the trench conductor material is carbon free.

6. The storage device in claim 1, characterized in that the substrate is free of carbon nanotube catalyst materials.

7. The storage device in claim 1, characterized in that the carbon nanotubes form a consistent lining along approximately the entire length of sidewalls of said trench.

8. The storage device in claim 1, characterized in that the device is planarized so that a top surface of the substrate is coplanar with respective top surfaces of the trench dielectric, the conductive carbon nanotube and the trench conductor.

9. The storage device in claim 1, characterized in that the conductive carbon nanotubes are grown downwards into the trench.